Appendix P

Glossary of Terms

APPENDIX P. GLOSSARY OF TERMS

Anomaly	Location of a system response deemed to warrant further investigation by the demonstrator for consideration as an emplaced ordnance item.
Azimuth	Positive clockwise direction of the ordnance nose from magnetic North
BA^{disc}	A discrimination-stage location outside R_{halo} of any emplaced ordnance or emplaced clutter item.
BAR^{disc}	= (# of BA^{disc})/(test area)
BA^{res}	An anomaly from the response stage outside R_{halo} of any emplaced ordnance or emplaced clutter item.
BAR^{res}	= (# of BA^{res})/(test area)
Blind Test Grid	A matrix of squares. Center of each grid block may be a target, a piece of clutter, or nothing to test demonstrator detection systems performance.
Calibration Lane	Contains targets from the standardized target list at 7 primary orientations to allow the demonstrator to develop a library on his detection system performance against known targets and location
Clutter	Clutter items may include fragments of military munitions which have functioned as designed or were recovered from areas where munitions have been intentionally destroyed and have no explosive, pyrotechnic or chemical filler; steel; aluminum; magnetic rock; or copper.
Degaussing	Removing any magnetic moments from ordnance targets
Demonstrator	Vendor, user, developer of UXO detection and discrimination technologies
Detection	An anomaly location that is within R_{halo} of an emplaced ordnance item.
Dip	Angle of inclination - Nose up + Nose down

Discrimination	The application of a signal processing algorithm or human judgment to response-stage data that discriminates ordnance from clutter.
Discrimination Stage	The ability to correctly identify ordnance as such, and to reject clutter. For the same locations as in the RESPONSE STAGE anomaly column, the DISCRIMINATION STAGE column contains the output of the algorithms applied in the discrimination-stage processing. This column is prioritized based on the determination that an anomaly location is likely to contain ordnance. Thus, higher output values are indicative of higher confidence that an ordnance item is present at the specified location. For electronic signal processing, priority ranking is based on algorithm output. For other systems, priority ranking is based on human judgment. The demonstrator also selects the threshold that provides "optimum" system performance, (i.e. that retains all the detected ordnance and rejects the maximum amount of clutter).
Efficiency (E)	$= P_{det}^{disc}(t^{disc})/P_{det}^{res}(t_{min}^{res})$; Measures (at a threshold of interest), the degree to which the maximum theoretical detection performance of the sensor system (as determined by the response stage tmin) is preserved after application of discrimination techniques. Efficiency is a number between 0 and 1. An efficiency of 1 implies that all of the ordnance initially detected in the response stage was retained at the specified threshold in the discrimination stage, t^{disc}.
Emplaced Clutter	A clutter item (i.e. non-ordnance item) buried by the government at a specified location in the test site.
Emplaced Ordnance	An inert ordnance item buried by the government at a specified location in the test site.
FAR	False identification of target in a empty grid cell.
FAR^{res}	= (# of BA^{res})/(# of opportunities)
FAR^{disc}	= (# of BA^{res})/(# of opportunities)
fp^{disc}	A discrimination-stage location within R_{halo} of an emplaced clutter item.

fp^{res}	An anomaly location that is within R_{halo} of an emplaced clutter item.
Large Ordnance	Caliber of ordnance greater than 81mm (includes 105mm HEAT, 105mm projectile, 155mm projectile, 500lb bomb).
Medium Ordnance	Caliber of ordnance greater than 40mm and less than or equal to 81mm (includes 57mm projectile, 60mm mortar, 2.75 inch Rocket, MK118 Rockeye, 81mm mortar).
NAD83 Datum	Expressed as an Easting/Northing UTM number.
Open Field Site	Minimum 4 hectares site with a myriad of clutter, range simulations, and targets to test demonstrator detection systems performance under real field type conditions
P_{det}^{disc}	= (# of discrimination-stage detections)/(# of emplaced ordnance in the test site).
$\underline{P_{det}}^{res}$	= (# of response-stage detections)/(# of emplaced ordnance in the test site)
P_{fp}^{res}	= (*# of response-stage false positives*)/(# of emplaced clutter items)
R_{BA}	$= 1 - [BAR^{disc}(t^{disc})/BAR^{res}(t_{min}^{res})]$; Measures the degree to which the discrimination stage correctly rejects background alarms initially detected in the response stage. The rejection rate is a number between 0 and 1. A rejection rate of 1 implies that all background alarms initially detected in the response stage were rejected at the specified threshold in the discrimination stage.
R_{fp}	$= 1 - [P_{fp}^{disc}(t^{disc})/P_{fp}^{res}(t_{min}^{res})]$; Measures (at a threshold of interest), the degree to which the sensor system's false positive performance is improved over the maximum false positive performance (as determined by the response stage tmin). The rejection rate is a number between 0 and 1. A rejection rate of 1 implies that all emplaced clutter initially detected in the response stage were correctly rejected at the specified threshold in the discrimination stage.

R_{halo}	A pre-determined radius about the center of/the periphery of an emplaced item (clutter or ordnance) within which a location identified by the demonstrator as being of interest is considered to be a response from that item. If multiple declarations lie within R_{halo} of any item (clutter or ordnance), the declaration with the highest signal output within the R_{halo} is utilized
Raw Sensor Data	Pre-processed or minimally processed data for each grid square or open field area.
Response Stage	The ability of the demonstrator's system to detect emplaced targets without regard to ability to discriminate ordnance from other anomalies. The RESPONSE STAGE provides the location and signal strength of all anomalies deemed sufficient to warrant further investigation and/or processing as potential emplaced ordnance items. This list is generated with minimal processing (e.g., this list will include all signals above the system noise threshold). As such, it represents the most inclusive list of anomalies.
ROC Curve	Receiver Operating Characteristic curve provides the only useful and valid means of comparing performance among sensor/algorithm combinations and for determining the efficacy of algorithm or technology advancements.
Small Ordnance	Caliber of ordnance less than or equal to 40mm (includes 20mm projectile, 40mm projectile, submunitions BLU-26, BDU-28, and M42).
Standardized Site	Made up of three areas – a Calibration Lane/Ground Test Pit, a Blind Test Grid, and an Open Field Site designed to test the demonstrators detection systems under various test parameters
Standardized Target	A military munition which contain no energetic material. These items pose no imminent threat. However, will remain under the control of the Standardized UXO Technology Demonstration Site On-Site Project Manager as issued by the ATC Program Manager.

Threshold	The limit, set on a system's discrimination stage, which defines the difference between what is considered to be ordnance and what is considered non-ordnance. Only those signals that exceed (or fall below, depending on the signal strength polarity) the threshold are considered to result from ordnance.
Target Repository	Located at Aberdeen Proving Ground, MD. Managed by the ATC Target Repository Standardized UXO Technology Demonstration Site Program Manager. 13 types of standardized targets available for loan.
Unexploded Ordnance (UXO)	A military munition that contains explosive or pyrotechnic charge and has been primed, fuzed, armed or otherwise prepared for action and which has been fired, placed, dropped, launched or projected, and remains unexploded by design or malfunction. An item of explosive ordnance which has failed to function as designed or has been abandoned, discarded or improperly disposed of and is still capable of functioning, causing damage to personnel or material. These can be, but are not limited to high-explosive warheads, rocket motors, practice munitions with spotting charges, torpedoes, artillery and mortar ammunition, grenades, incendiary munitions, electro-explosive devices and propellant-actuated devices. Fuzes with live explosive boosters or detonators are classified as UXO. All UXO are potentially dangerous and cannot be released for public use without being rendered safe (neutralized, vented, detonated, decontaminated or demilitarized).